Lab – The Pendulum

Purpose: 1. To determine the factors affecting the period of a pendulum
          2. Using the data collected, to find the acceleration due to gravity.

Background Info:
        Discuss the simple harmonic motion of a pendulum. Make sure you define: amplitude, period, frequency, length of pendulum.

        Discuss what factors theoretically should affect the motion of the period of pendulum.

        Discuss how it is possible to find the acceleration due to gravity using the data collected – including the formulas that should be used and the graphs that should be graphed to find the appropriate values.

Materials:
        Pendulum apparatus
        Retort Stand
        Timer/Stop Watch

Procedure: (Rewrite this properly… in past tense, no personal pronouns)
1. Set-up the pendulum apparatus as shown by your teacher.
2. Investigate the factors affecting period by changing several factors (one at a time) such as:
   - amplitude of swing of pendulum
   - mass of the pendulum weight
   - length of pendulum string
   Make sure you record QUANTITATIVE data to be able to discuss further in the discussion.
3. To calculate the acceleration due to gravity (g) you will need to collect multiple values (7 – 10 data points) for the length of the pendulum and the resulting period. To get an accurate value for period, record the time for a large number of swings and then divide the resulting time by the number of swings.
4. Using the data collected in #3, make an appropriate graph and the appropriate calculations to determine the acceleration due to gravity.

Observations:
        Record all your measured data in table format.

Analysis:
        Place all your calculated data here – in table form.
        Show sample calculations
        Put your graph(s) in analysis
        Using the appropriate graph, find (and show how you did it) the acceleration due to gravity
        Find the %error comparing your experimental result with the theoretical 9.8 m/s^2.

Discussion:
        Using quantitative results (collected in procedure #2) discuss what factors you found affected the period of a pendulum.

        Discuss any applications in the real world of the period of a pendulum

        Sources of Error

Conclusion:
        Statement answering both parts of the purpose.